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Restructuring Biotecnol

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Abstract – Restructuring Biotecnol

This paper is a case-based essay on a biotechnology company – Biotecnol – which is undergoing a period of crucial decisions regarding its activity: to maintain its business as it is, meaning it will continue to provide services together with the development of proprietary products; or to decide to focus on only one area giving up on the other.
In order to perform this project, I had several meetings at Biotecnol's headquarters with both the CEO and the CFO. During these encounters we had long conversations where I had the opportunity to discuss and place all the questions and doubts regarding the history of the company in order to fully understand its background and business.

Acknowledgements

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Guilherme Lopes da Costa

Restructuring of Biotecnol

Deep in the spring of 2012, Dr. Pedro Pissarra was having lunch in the terrace of a restaurant in Lagoas Park at Oeiras, where Biotecnol's office is. The cloud free sky and the shiny sun were clearing his mind in order to reflect about the next step his company should undertake.

Being a biotechnology company with a keen interest on oncology, Biotecnol was experiencing some difficulties regarding the business model it should follow. On one side, the company had its consulting and manufacturing support services provided to pharmaceutical companies, which was Biotecnol's first step when it was created; on the other side, proprietary product development, the evolution of which was drawing the attention of the biotechnology industry.

The past years had been complex. Having its proprietary product development infrastructure initially based in Portugal, Dr. Pedro Pissara had a hard time convincing investors to put their money into work on a Portuguese company such as Biotecnol. Eventually, in 2011, the Company moved its proprietary platform of Tribodies to its American subsidiary, Biotecnol Inc., where products could be much more easily developed.

Between 2005 and 2007, as investment was not flowing at the same rate of its needs, Biotecnol was forced to accept shareholder loans, which were associated with high interests and kept accumulating to shareholders debt in an unsustainable form. By the end of 2011 the Company was able to convert shareholders debt to equity, thus equilibrating its finances.

A couple of months later, Pedro Pissarra was considering how to proceed with the strategy of the Company and the main questions at stake where: how to develop the proprietary platform of Tribodies; should the services follow an independent route from the products or became further specialized in the proprietary products; where to focus future investments: in the US or in Europe. Enjoying the sunny day, he was certain that the future included many possibilities to be explored, a situation that he became used to deal with at Biotecnol.

Biotechnology market overview

According to EuropaBio[1], "The word biotechnology is a cross between the Greek words 'bios' (everything to do with life) and 'technikos' (involving human knowledge and skills). The OECD (the Organization of Economic Co-operation and Development) defines biotechnology as "the application of scientific and engineering principles to the processing of materials by biological agents". More simply, it is using living organisms to make useful products."

Although biotechnology was already used before 1900 on beer brewing, Paul Berg[2] was, allegedly, the one who founded modern biotechnology in 1971, being awarded the Chemistry's Nobel Prize in 1980 "for his fundamental studies of the biochemistry of nucleic acids, with particular regard to recombinant-DNA" [3]. From then on, this industry has seen an exponential growth, in the life sciences, agricultural and industrial sectors.

Until the global financial crisis burst, biopharmaceutical companies in the US were keeping an increasing rate investing on R&D, as presented in Exhibit 1. When analysing this type of companies, R&D has been considered a valuation vehicle (the more expenditure on R&D, the more valuable the company).

Although nowadays this industry is returning to the standards that were in force prior to the global financial crisis, the paradigm is changing: today, the markets that grow the most are the highly growth economies (BRIC's), which formerly were not considered in the business markets. The dynamics of the business is also moving from pharmaceutical companies to the hospital / medical / doctor epicentre with the specialisation of global health companies in part of the value chain changing the paradigm of this business, and investors becoming highly specialized.

Previously, private equity and venture capital investors were very active, helping in the development of small and mid-cap companies by financing the improvement of their products and taking them to further stages of the pipeline.

In the current economic framework, these investors are slowly turning away from biotech companies, forcing the industry to adapt to a new scenario. The Big companies from the pharmaceutical industry (Pfizer, GSK, Roche or Merck) are returning to school, coupling with universities in order to have a chance of improving their findings and, consequently, revenues. "Smaller biotechnology firms would also seek to divest their businesses to larger companies or enter into in-licensing collaboration and partnerships with cash-rich large companies owing to limited capital availability" [4]. Consequently, they acquire not only the company and the service/product it provides, but also the most important thing: human capital.

On the other hand, in Portugal, the sector was not experiencing a boom and its dimension is equivalent to the country: very small. In 1996, year of Biotecnol's birth, there was a void in the

[1] EuropaBio, founded in 1996, is the European Association for Bio industries.

[2] American biochemist the propellant of recombinant DNA.

[3] The Nobel Prize in Chemistry 1980.

[4] Inc., Global Industry Analysts. Jan 2012. *Biotechnology: A Global Outlook*.

Portuguese biotech market. While Europe and, specially, the United States, were already thriving for the billion-dollar industry, the Portuguese market was still in its inception.

Investment was not abundant and companies could not have a straight access like their comparable in other regions of the world. The Portuguese Government had created *InovCapital*[5], a state owned venture capital firm intended to develop and help national companies grow, along with *AICEP Capital* [6], also a state owned venture capital firm focused in the internationalization of the Portuguese economy. Through entrepreneurship and the active participation in their capital, *InovCapital's* goal was to give special attention to sectors such as natural resources, information technology, or life sciences. With the motto "Partnerships of Success to Innovation", this firm's purpose was to increase the capacity of Portuguese companies to compete internationally, as well as to boost their competitiveness within the internal market. Private venture capital and private equity investors were also investing in the same sectors, most of them clearly limited in their financial resources and often investing in consortium with the public funds. APCRI[7], the representative structure of the venture capital in Portugal, was also in action to coordinate and manage the interests of private and government owned firms in this market, promoting the exchange of know-how and information among its members and with their European equivalents.

The oncology market

Oncology is, nowadays, the biggest and fastest growing segment of the biotechnology and pharmaceutical markets. Supported by an increased targeted therapeutic, people are willing to pay a higher premium for better life quality, as well as for the expansion of life expectancy.

Historically, cancer has been fought by an array of treatments ranging from chemotherapy, surgery, or radiation therapy. Currently, however, is has evolved to a more specific approach - of which monoclonal antibodies are a good example - targeting those signalling pathways that are deregulated in tumours; helping to reduce side effects, thus achieving lower broad impact solutions when compared with standard treatments. These advances do not come unnoticed though: companies are spending billions on R&D in order to improve their pipelines and product set.

According to Farmantra[8], "Global oncology market is expected to reach $76.7 billion by 2014. The market is expected to grow at a CAGR of 8.2% between 2008 and 2014. Collectively, the leading seven cancer markets (US, Japan, France, Germany, Italy, Spain, UK) represent approx.

[5] *InovCapital's* name changed into Portugal Capital Ventures as of 15/06/2012.

[6] *AICEP Capital*'s name also changed into Portugal Ventures as of 15/06/2012.

[7] Portuguese venture capital association.

[8] A life sciences consulting company who provides services to small and medium sized companies from this sector in order to help them grow internationally.

80% of global sales."[9] To reinforce the importance of the oncology market, two major companies merged in 2009. Roche, the big Swiss pharmaceutical, bought Genentech, the biggest and oldest biotechnology company in the world, for $46.8 billion[10]. This deal bolstered the Swiss company as the market leader on oncology, now present in both Europe (Roche itself) and the United States (through Genentech). Exhibit 2 shows the top ten companies in the oncology market in 2014. Biotechnology companies are imprinting a great influence in the oncology market due to their ability to create innovative and competitive products. This is the reason why "partnering with biotech companies is a key (but expensive) source of innovation for many pharmaceutical companies as approximately 75% of phase II, III and pre-registration innovative drugs are of biotech origin."[11]

Although the market is flourishing, players should always be aware of pricing risk. Due to the constant innovations products are facing, patients may not be able to pay for high priced products, regardless of the benefits they may bring to their health. While being a proposition that has never been challenged, this is a present and possible threat for the pharmaceutical industry.

Biotecnol's birth

Soon after completing its Ph.D. studies at King's College in 1996, Dr. Pedro Pissara founded Biotecnol as a provider of consultancy services to pharmaceutical firms (Exhibit 3 with biographies).

Although its start was as a consulting and manufacturing provider services firm to pharmaceutical companies, soon Pedro Pissarra realized that Biotecnol would not grow to its full potential unless it had its own products, with in-house development.

Throughout the following years, the company's strategy changed from the offer of services to the development of proprietary products[12]; nevertheless, the third party services were maintained. In Dr. José Luis Moreira's words, "services are tactics – short run measures to win the next soccer game; products are strategy – long run methods to triumph in the big championships". This strategy allowed suppressing cash flow needs, such as salaries or payments to suppliers. The lack of investment to enhance product development limited the development of its proprietary products, but this activity was never dropped. Since 2003 the company was seeking for investment in its products, based on the Portuguese firm. Some shareholders accepted to financially support the company in between, so that Intellectual

[9] Farmantra. March 2011. *Oncology Market: Evolution of Treatment, Commercialization and Managed Care*, Newsletter.

[10] Pollack, Andrew. March 12, 2009. *Roche Agrees to Buy Genentech for $46.8 Billion*, The New York Times.

[11] Newswire, PR. March 2010. *The Cancer Market Outlook To 2014: Competitive Landscape, Market Size, Pipeline Analysis and Growth Opportunities*.

[12] To further knowledge please read *Biotecnol: Financing a Cure for Cancer in Portugal*.

Property and the products being developed internally were not lost. Between 2005 and 2007, as investment was not flowing at its needs, Biotecnol was forced to accept shareholder loans, which were associated with high interests.

In order to strengthen the financial health required to capacitate the company to fulfil the goal of developing products, Biotecnol, Inc. was created in the United States by 2006. Biotecnol's purpose was to generate proprietary products that would be sold to big pharmaceutical companies in exchange for milestones and royalties, and also to have a proprietary platform with which it could gain a competitive advantage regarding its competitors. Biotecnol underwent an operational restructure in 2008, and a financial one in 2010, in order to improve its business prospects for the future.

Restructuring operations

As a prelude to the operational restructuring, in late 2007 the company underwent an external valuation performed by a prestigious and certified company, BioScience Valuation (BSV) [13], to analyse Biotecnol's options regarding a new private placement. The result came out with a clear conclusion regarding Biotecnol's price per share; after performing a real option methodology considering Biotecnol's portfolio, the conclusion was that the price per share had doubled in the last three years, despite the lack of financial resources.

Nevertheless, investment was not flowing to comply with the company's needs and a new approach strategy had to be developed in order to guarantee the company's survival.

The management team met in January of 2008, when they perceived that the investment round that was supposed to happen was going to fail, and decided to deal Biotecnol's restructure into two complementary dimensions:

- First: they would tackle the restructuring of operations, a pre-requisite for the survival of the company;
- Second: they would move to the financial restructure, and in particular shareholder's debt, assuming operations were already up and running.

After this meeting, it became clear that services would be the redemption to increase revenues. However, proprietary products would not be disregarded; since CAB051[14] had lost significant value[15] due to the low intellectual property (IP) timespan remaining, Biotecnol's Tribodies proprietary platform became the most important project under development. The Tribodies platform allowed the generation of multi-specific antibody products. Furthermore, Tribodies proved its resourcefulness by incorporating and combining different antibody fragments, as well as other protein types.

[13] A German consultancy firm specialized in the biotechnology industry.

[14] CAB051 is a human monoclonal antibody that targets breast cancer.

[15] As time passed by, the cost of maintaining a patent increases, and if the product is not on the market, the company is losing money by not making revenues from it.

Backed by the company's shareholders, the management team was able to increase the firm's services to third parties and implemented the changes needed to improve operational results thus achieving the stabilization of Biotecnol's activity (Exhibit 4). 2008 was a success: sales more than tripled the value of 2006 and confirmed the decision to change Biotecnol's view of business. Although still with negative operational results, these values were ten times lower than those of the previous year.

In the following year two big contracted services were early stopped due to clients' shortage of financial resources to develop it. The European Sovereign debt crisis arrival implied that, again, Biotecnol had to adapt: late that year the company got some lower budget projects that were critical to keep the cash inflow.

This move proved to be the right decision, since these low budget projects became very important in the following year. 2010 was a milestone in Biotecnol's life, given that the company registered its first over €2 million sales and positive operational results.

Financial restructure: building-up internal structures

Back in 2003, when Biotecnol was already growing to a considerable size in operating activities, *InovCapital* (Exhibit 5.a) imposed the entrance of a renowned international auditor to analyse and validate its financials. Until then, a local certified company ensured the account revision.

José Luis Moreira was hired for the CFO position in April 2007, as part of Biotecnol's evolution from a start-up to a senior corporation with a more formal management structure.

His scientific and technical background added to his prior experience in the banking sector and in the Private Equity business converged in the right combination of qualities Biotecnol needed to optimize its financial and operation management.

By 2008, his team implemented a new management control and financial accounting system that allowed an excellent control over the company's activities. This was done by fully controlling all cash fluxes in the company as well as the allocation of each employee to each task of a project. In Dr. José Luis Moreira's words, "This was essential to control the costs of each phase of each project. The most difficult task was to have the scientists providing this information once, although they have freedom to perform their work they also need to understand that it is central for the business to comply with these control methodologies and they do not mean a form of direct control on themselves". To further consolidate internal structures, José Miguel Santos was hired in February 2009 as a financial controller, reporting directly to José Luis Moreira.

This period of experience with a renowned international auditor and the increase of internal management competencies proved to be of the utmost importance during the transition from the POC to SNC.

From POC to SNC – an accounting issue

Portugal experienced an enormous change in its accounting rules in 2010, this being the result of a standardization process within European Union's regulation. In sum, all companies that were trading in the stock exchange needed to adopt a set of international standards (IAS/IFRS) issued by the International Accounting Standards Board (IASB). This new rule also led to a change in the Portuguese accounting standards, previously called *Plano Oficial de Contabilidade* – POC, in order to meet EU's standardization process and adopt *Sistema de Normalização Contabilística* – SNC.

Since its inception, the auditors asked Biotecnol to classify all the expenditures of its activity, including those directly supported and related with the development of proprietary products as costs of the year in its financial statements, in line with the accountability rules in force at the time.

This situation meant that the pay out of intellectual property and patents were always classified as costs of the year, instead of investment; if it had been considered an intangible asset Biotecnol would have had better financial year statements.

Biotecnol made the transition from POC to SNC in 2010, which meant that the previous year's financial statements also had to be analysed in accordance with the new accounting standards of the SNC. The new standardization process clarified the definition of intangible assets related with R&D activities, both for the current year under evaluation and also for the conversion of costs from the previous years. This allowed the management team at Biotecnol to consider the reclassification of former costs as well as investment incurred along 2009 as intangible assets.

Regardless of this new ruling, the auditor was inflexible and refused to accept Biotecnol's request of reclassification of costs as intangible assets. Their argument was based on the fact that in the past they had never classified costs as investments, and that no objective evidence changed. Even after the company showed, line-by-line of the norm, that they were complying with every demand to have the expenditures eligible as investments, the auditor was unbending in its decision.

This led to a complex situation where shareholders were claiming that the financial operation was not being optimized: in José Miguel Santos's words, "It is time for us to analyse and discuss the true mission of Biotecnol."

In the end, this dispute led to a reservation in the approval of the financial statement of 2010 by the auditor. The financial statement of 2010, as defended by the management of the company, was approved in the Shareholders Meeting by all shareholders except *InovCapital*, which abstained.

Financial restructure

Following the great achievements in the operations side, in 2010 Biotecnol turned its focus to the financial restructure. Since 2004 and until 2007 Biotecnol was desperately in the need for money to address its short-term cash flow necessities to keep the company moving, whereas the next round of investment (that never occurred) was being planned. This was the only way to continue to pay IP direct and indirect costs as well as to support costs of the on-going work on the internal development programs. The solution came from the inside: shareholder loans from *InovCapital* and Pharmis (Exhibit 5.b), and along also came the associated interest-bearing shareholder loans to be paid shortly after, with high and prohibitive rates that putted an enormous pressure on the company's cash flows.

Interest-bearing shareholder loans were increasing along the years, resulting from the cumulative loans and non-paid interest. By 2009, there was a large amount of interests due to shareholders, mainly *InovCapital*, and in José Luis Moreira's words, "this was the year that financial costs raised approximately one quarter of the historical maximum revenues of €2 million, thus completely unsustainable despite the operational success of the company." The goal of having free cash flow to invest in the development of products was completely unrealistic, since it wasn't enough to suppress the existing debt costs. This was the reason why Biotecnol had to face a critical decision regarding its financials: either focus on products and hope that the cash flow generation would suppress debt and its due costs to creditors; or to convert debt into equity and render creditors as a part of the shareholder structure. Taking into consideration the difficulties the company was facing, namely regarding the attraction of investment for its internal projects based in Oeiras, the obvious choice was the latter. Moreover, the fact that creditors were already within Biotecnol's shareholder structure would simplify this conversion – there was no need to convince creditors to believe in the company and its business since they were already a part of it.

The CFO knew that this negotiation could turn into a drawback if he followed a sequential approach to the problem. For example, converting firstly Government owned investor's credit would make private investors unhappy, and the other way around was also true – no investor would want to be jeopardized in the negotiations. There was a significant group of non-creditor shareholders and no investor would want to be worse off than the other. So, the CFO thought of optimizing the process as if it were the case of a multi-variable process engineering optimization. The challenge was to demonstrate to all parties that an optimum for Biotecnol, actually the unique solution for the survival of the company, was a solution that, although reasonable for all shareholders in the company, was not the best for any of them. The proposal took two and a half months to prepare, since the shareholders needed to be convinced that all was being done in the best interest of the company, and a fair and rightful solution was to be presented. In the CFO's words "the final solution was a house of cards in the sense that every shareholder, every interest, was like a different card of a different suit. As predicted, not every party enjoyed the solution proposed, once in their opinion, it did not optimize each one's interests. But at the same time, if one player tried to moved its card to become a little better off,

the house would fall – and all remaining shareholders would be looking at this player thinking 'what are you doing?' – and this lead to a better understanding of the proposal".

InovCapital and Pharmis – Biotecnol's creditors

Throughout the years, *InovCapital* and Pharmis, both shareholders of Biotecnol, had lent money to the company, in order to suppress some short-term cash flow needs. Both were expecting their return some time in the future, along with the interest bearing associated with these operations. Once the cash flow needs persisted, these shareholders soon became creditors, with interest bearing shareholder loans escalating.

Pharmis entered Biotecnol's shareholder structure because it wanted to diversify its portfolio in the biotechnology market. Having a keen interest in cancer treatments, Pharmis invested in IP rights to develop a biological molecule, in line with Biotecnol's business area. Pharmis lent money to Biotecnol in 2005 with a clear short term objective; in fact, Pharmis was entitled to receive back from Biotecnol the money it had lent previously to suppress short-term difficulties in cash flow. The new investment round, expected for the following months, would allow Pharmis to be reimbursed of its loan and enable the company to concentrate on its core business and to invest in its own projects. Since that round never occurred, the pharmaceutical company could have assumed a position of strength towards Biotecnol and ask for all its investment back. Instead, it decided to back up Biotecnol and be in line with its needs and strategic objectives.

Government owned *InovCapital* entered Biotecnol's shareholder structure of the company in the last capital increase at the beginning of 2004. In need of money to develop its proprietary products, Biotecnol gladly accepted the entrance of the venture capital company. Despite the investment plan that needed €3 million to bring Biotecnol's star product to the end of pre-clinical phases, the cash injection of *InovCapital* at that time involved only €1 million. Since the closing process took more than 6 months, more than half of that money was immediately used to pay the accumulated debt to suppliers. Until the end of 2007 *InovCapital* led several attempts to syndicate the required round of investment. The loans realised in the company were expected to be converted in shares in the following share issue, which never occurred.

In 2011 Biotecnol and *InovCapital* negotiated the transformation of the latter's shareholder credits (loans and interest) into equity. The operation was meant to allow Biotecnol to decrease its financial costs, since the interest-bearing shareholder loans were soaring. This could be done in two possible ways. The simpler one was the conversion of the credits into shares, to be issued at an average share price that would reflect the value of the company in 2004 (when *InovCapital* invested in the company) and the value of the company in 2007 (resulting from the BSV due diligence and valuation of the company). The rational was to assume equivalency to successive investments along that timeline. The possibility of disregard interest (and to assume only the loans) was highly discussed but refused by *InovCapital*.

The negotiation process took almost 10 months and was closed by the mid of December, so that any final solution could be reflected in the year balance of both companies. At that time a simpler solution was agreed: to immediately convert all credits into paid-in-capital (without any interest, so that these could be immediately assumed as equity), to be converted into new shares along the following year.

This solution was conditioned to include Pharmis in the same condition, which was accepted. At the end of the lengthy negotiation process, *InovCapital* ended up by selling its equity stake and credits to the majority of the remaining shareholders. The deal represented some lost for *InovCapital*, and implied an agreement that creditors retain some upside (or clawback clause) during several years. With the effort of the private shareholder base to buy *InovCapital's* shares, Biotecnol became a privately owned company again. In the beginning of 2012, the shareholders owner of credits converted it into shares in similar conditions to those previously agreed with *InovCapital*.

Potential of the internal assets of the company: Tribody platform and multi-specific antibodies

The Tribody platform and multi-specific antibodies constituted an important asset of the company, and the management team knew that, although short on cash to invest in it, Biotecnol needed to keep its development and to continue with the bet on the company's value creation based on it. The proprietary Tribody platform allowed Biotecnol to have its own targeted breast cancer products made in-house. This technology keeps Biotecnol in the pool position of the recent and hot area of multi-specific antibodies, that should be the next generation of biopharmaceutical products; Tribodies "takes the binding ability of its antibodies even further (…), which use the natural in vivo heterodimerization of Fab fragments to form a scaffold on which additional proteins can be incorporated."[16]

Biotecnol needed to take the product to the three-phase FDA approval process (Exhibit 6), in order to guarantee its commercialization in the market. But the company had to license the Tribody derived products to big pharmaceutical companies in order to provide Biotecnol with some short term cash as well as the milestones associated with the different approval phases throughout the process along with a royalty linked to the sales of the product. The major return was associated with the milestones and royalties on sales.

With its own valuation method and with solid projections, José Luis Moreira performed an assessment of one Tribody product, so as to verify its potential as a product that could generate future cash flows for the company. Having already the patent on the proprietary platform that will produce the product, its remaining life was of 18 years. Since the FDA process would take nearly 8 years, the product would have a 10-year period of exclusivity in the market. He believed that with the valuation of one product it is a simple exercise to value the platform.

[16] Moran, Nuala. June 2012 .*Bi-specific Antibodies Making R&D Headway at Long Last*.

Typically, to have some of the products being approved in clinical phases was a normal requisite of the multinational pharmaceutical companies in order to acquire the technology. This is also of major interest to Biotecnol, in order to maximize its return (early licensing in this industry is not so common and highly asymmetric in value distribution between the biotechnology and the big pharmaceutical companies). However, to get there Biotecnol needed a significant investment, in order to finalise the process development and production work and perform all pre-clinical tests. After the experience with CAB051, by 2011 Biotecnol knew that this time the output had to be different, and Pedro Pissarra knew that a strategic movement originated inside the company was the necessary step. An international company since its origin, it was time to move the epicentre of the business outside of Portugal.

Internationalisation – the strategic move towards the United States

2006 was already running when Biotecnol Inc., a subsidiary of Biotecnol, was incorporated in the United States. The decision to have it in the US was pretty easy to understand: this country had the most mature market of biotechnology in the world, where the number of patents filled was higher than in any other region of any continent (Exhibit 7.a), and where investment in billions of dollars was also larger than in any other country (Exhibit 7.b). Historically, the US was the leading propeller of biotechnology in the world.

As the middle of the summer of 2011 was passing by, the American subsidiary acquired the Tribodies proprietary platform from Biotecnol, alongside with the IP's and patents rights, products, materials and know-how. At that time it became clear for both the Officers and the Board of Biotecnol that the company's strategy had to change. In the centre of the Sovereign debt crisis, Portugal was a country that did not offer the conditions required to develop a more capital-intensive activity and with risk adverse Portuguese investors, where an annual several million investment in a single biotechnology business was completely unusual. Plus, the fact that Portuguese Government was rated junk by the credit rating agencies meant a hard time to convince foreign investors that a company like Biotecnol, in a country that had no history or tradition in the biotechnology sector, was indeed a good investment proposal. Pedro Pissarra knew that it was feasible to operate in Portugal and establish a complete set of competencies and skills but not to guarantee the adequate financing of its internal projects.

The strategy behind this deal between Biotecnol and its American subsidiary was straightforward: the platform of products would be moved to the US where there perception of value creation exists, the know-how was already within the company, and the money necessary to start off was also available.

The value of the transacted assets from one company to the other implied its careful valuation; it had to be rightly priced so that no company was gaining from this deal - either Biotecnol selling at a discount, or the American subsidiary buying at an overpriced value. This was done using the know-how of the accumulated development and IP costs (Biotecnol SA used its accumulated know-how derived from the evaluation of proposals for external clients to do it at

market prices). The comparison with recent market transactions was also performed, and eventually this was evaluated by the newly appointed auditor for Biotecnol.

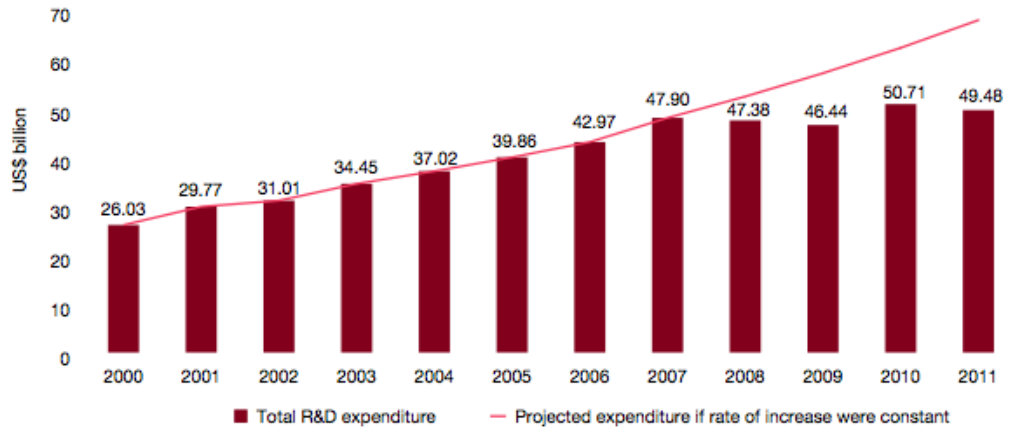
Biotecnol SA and its American subsidiary agreed to have 15% paid in cash and the remaining in equity, and a group of shareholders invested approximately $1 million in the subsidiary. This deal meant issuing a high number of shares from the subsidiary, but Biotecnol kept the majority position, preparing the company to the next round of investment, that could push the products based in the Tribody platform up to clinical trial phases. Exhibit 8 explains this process thoroughly.

The short-term financial needs were going to be supported by the cash invested in the subsidiary and in contracts to be signed with companies based on product licenses. Thus, part of the money was used to pay the assets acquired to Biotecnol and also to be invested by the subsidiary in the plans to further develop its proprietary products.

The Dilemma – challenges and opportunities for the future

Pedro Pissarra was a regular attendee at the JP Morgan Healthcare Conferences, held every year in January in San Francisco city, "where the world of biotech companies comes together, giving investors and industry leaders the opportunity to get a grasp of the market and where it is heading" in Pedro Pissarra's words. In the aftermath of the 2012 Conference, the CEO of Biotecnol's American subsidiary got the reaction that "the market liked our platform, and accepted it, so we have a way out there, but our success is going to be dictated by our ability to sell the products and/or the platform". For Pedro Pissarra there was no doubt that the value of Biotecnol lays on the Tribody platform. Splitting the company's resources between their development and the provision of services to third parties would inevitably prove to result in a clear lack of focus which could be detrimental to the required fast move on development of the company's proprietary products. On the other hand, providing services could become a regular source of cash flow to be used to partially finance the company's R&D activities, thus making it less dependent on external sources of finance. Pedro Pissarra was sure that the company should fully concentrate its resources on taking the Tribodies into clinical trials as soon as possible, in order to maximize useful lifespan of their patents once they reach full FDA approval. Focus is key for success. Should the company ignore the opportunities and the advantage gains in the consultancy and services to provide to pharmaceutical companies deriving from its expertise and reputation? Should Biotecnol resist the temptation of generating the corresponding cash flows? Evaluating pros and cons of both possibilities, Pedro Pissarra was trying to figure out an optimal solution that could resist to all scenarios.

Exhibit 1 Big pharmaceutical's R&D expenditure from 2000-2011



Source: Pharmaceutical Research and Manufacturers of America (PhRMA)
Note: Between 2000 and 2007, R&D expenditure rose at a compound annual growth rate of 9.1%. If this trend had continued, PhRMA's members would now spend nearly $68 billion a year on R&D

Exhibit 2 Top ten companies in the oncology market in 2014

Total WW Oncology Market (excludes immunomodulator products): companies ranked by market share in 2014

	WW annual sales ($m)		CAGR (07 - 14)	Market Share		Market Rank	
	2007	2014		2007	2014	2007	2014
Roche+Genentech	*13,885*	*28,251*	*11%*	*32%*	*38%*	*1*	*1*
Roche	7,600	16,793	12%	17%	22%	-	-
Genentech	6,285	11,459	9%	14%	15%	-	-
Novartis	3,991	6,914	8%	9%	9%	4	2
Bristol-Myers Squibb	1,562	4,188	15%	4%	6%	7	3
Pfizer+Wyeth	*2,735*	*4,037*	*6%*	*6%*	*5%*	*5*	*4*
Pfizer	2,640	3,668	5%	6%	5%	-	-
Eli Lilly	2,446	3,079	3%	6%	4%	6	5
AstraZeneca	4,757	2,748	(8%)	11%	4%	3	6
Bayer AG	942	2,538	15%	2%	3%	9	7
Johnson & Johnson	802	2,307	16%	2%	3%	10	8
Merck KGaA	665	2,155	18%	2%	3%	12	9
Sanofi-Aventis	4,902	2,107	(11%)	11%	3%	2	10

Source: Alpha, Seaking. April 2009. *Genentech Seals Roche's Dominance of Oncology Market*.

Exhibit 3 Biotecnol Department Chiefs' curricula

Pedro Pissarra, Chief Executive Officer (CEO) – B.Sc. and Ph.D. in Biotechnology at King's College, University of London; Masters in Science and Technology Management and Commercialization at the University of Texas and at the *Instituto Superior Técnico*; founder of the Portuguese Bio-industries Association (APBio); former board member of Vida Rhein, S.A.; member of the Superior Counsel for Science, Technology and Innovation of the Portuguese Government and visiting professor at the Catholic University of Oporto.

Andrew Kelly, Chief Scientific Officer (CSO) – B.Sc. and Ph.D. in Biotechnology and Molecular Biology at King's College; responsible for the management and development of Biotecnol's IP portfolio and liaison with academic research partners; visiting professor at the University of Newcastle.

Philip Cunnah, Chief Development Project Officer (CDPO) – B.Sc. and Ph.D. in Microbiology at University College Wales and University College London; post doctoral scientist at the *Instituto Superior Técnico*; Chartered Institute of Marketing course on Marketing Operations; former Senior Scientist and R&D Manager at Biocatalysts.

José Moreira, Chief Financial and Operational Officer (CFO and COO) – B.Sc. and Ph.D. in Chemical Engineering at the *Instituto Superior Técnico* and at *Universidade Nova de Lisboa*; MBA at *Universidade Nova de Lisboa*; Executive Manager of the Animal Cell Technology Unit of *Instituto de Biologia Experimental e Tecnológica* (IBET); worked at the Private Equity firm TottaFinance and at the Corporate Finance and Banking Divisions of Santander Bank, in Portugal.

Bernard Brigonnet, Business Development Officer (BDO) – more than 30 years of experience in the Pharmaceutical and Biotechnological industries; several senior executive management positions, at top leading companies such as Merck & Co, Inc., Bristol-Myers Squibb Co., IDM Pharma and Serono.

José Miguel Santos, Financial Controller – Degree in audit and accounting at *Instituto Superior de Contabilidade e Auditoria de Coimbra* (ISCAC), worked at TÜV Rheinland Portugal as Financial and Administrative coordinator and former charted accountant of several Portuguese companies.

Source: Biotecnol

Exhibit 4 Biotecnol's Balance Sheet and Income Statement (thousand of EUR) from 2001-2011

Balance Sheet

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
ASSETS											
Current assets	134,0	201,6	248,8	1 273,2	638,4	700,7	1 106,3	950,1	276,3	427,1	1 860,4
Long-term assets	344,2	268,7	201,8	216,0	369,7	427,7	367,8	397,2	319,5	1 498,5	655,2
Total assets	**478,2**	**470,3**	**450,7**	**1 489,2**	**1 008,1**	**1 128,4**	**1 474,1**	**1 347,3**	**595,8**	**1 925,6**	**2 515,6**
LIABILITIES											
Current liabilities	849,9	2 186,7	982,0	1 214,7	2 098,0	3 467,9	5 248,6	5 615,8	5 409,7	5 994,2	1 125,7
Long-term liabilities	-	-	-	23,2	276,6	433,5	554,8	329,2	462,5	689,4	561,5
Total Liabilities	**849,9**	**2 186,7**	**982,0**	**1 237,9**	**2 374,6**	**3 901,4**	**5 803,4**	**5 945,0**	**5 872,2**	**6 683,5**	**1 687,2**
SHAREHOLDERS EQUITY	(371,8)	(1 716,4)	(531,3)	251,3	(1 366,5)	(2 773,0)	(4 329,3)	(4 597,7)	(5 276,4)	(4 758,0)	828,4
Total liabilities and shareholders' equity	**478,2**	**470,3**	**450,7**	**1 489,2**	**1 008,1**	**1 128,4**	**1 474,1**	**1 347,3**	**595,8**	**1 925,6**	**2 515,6**

Income Statement

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Sales	54,2	115,0	904,0	987,5	557,0	390,3	1 015,2	1 413,5	1 327,9	2 102,7	1 065,6
Other operating expenses	(163,5)	1,1	(0,9)	0,2	2,1	2,8	(14,1)	(0,8)	22,8	61,5	26,0
EBITDA	**(795,6)**	**(1 101,3)**	**(310,4)**	**(1 105,0)**	**(1 173,3)**	**(941,2)**	**(987,0)**	**329,7**	**18,6**	**567,3**	**866,9**
Provisions and depreciation	188,3	94,6	83,4	69,5	217,7	302,3	219,6	108,7	100,1	238,8	212,3
EBIT	**(983,9)**	**(1 195,9)**	**(393,8)**	**(1 174,5)**	**(1 391,0)**	**(1 243,5)**	**(1 206,6)**	**220,9**	**(81,5)**	**328,5**	**654,6**
Other non-operating expenses	34,3	48,5	40,1	18,2	36,3	162,9	348,7	487,8	585,2	420,3	22,4
PRE-TAX INCOME	**(1 018,2)**	**(1 244,4)**	**(433,9)**	**(1 192,7)**	**(1 427,3)**	**(1 406,4)**	**(1 555,3)**	**(266,9)**	**(666,7)**	**(91,8)**	**632,2**
Income taxes	2,7	0,9	1,0	2,0	2,2	1,2	1,0	1,5	12,0	175,3	(17,5)
NET INCOME	**(1 020,9)**	**(1 245,3)**	**(434,9)**	**(1 194,7)**	**(1 429,5)**	**(1 407,6)**	**(1 556,3)**	**(268,4)**	**(678,7)**	**(267,1)**	**649,7**

Source: Biotecnol

Exhibit 5.a *InovCapital*

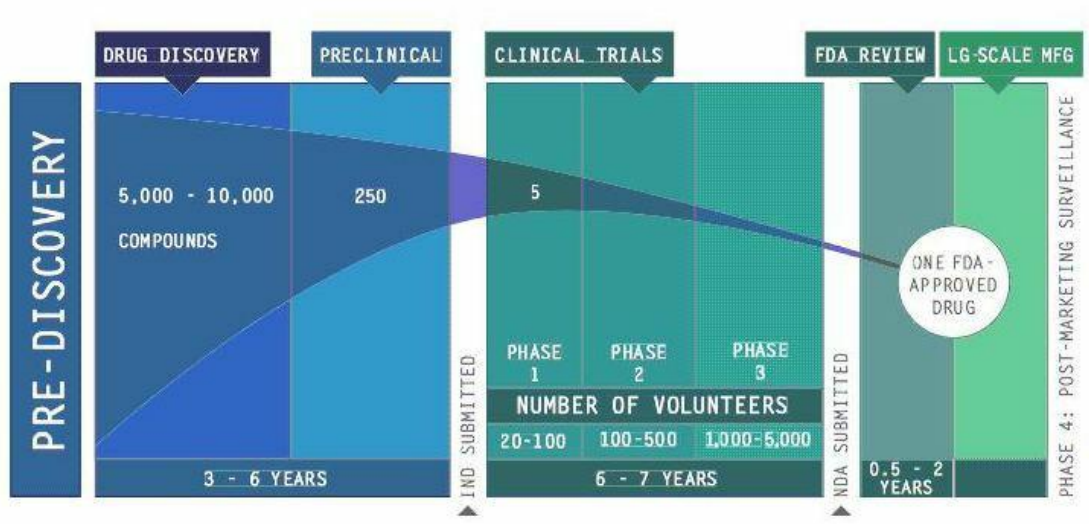
InovCapital – Sociedade de Capital de Risco, SA, was a venture capital and private equity section of *Instituto de Apoio às Pequenas e Médias Empresas e à Inovação* (IAPMEI), founded in 1989, specialized in seed/startup, early, mid, and late venture stages, buyouts, growth capital investments, and emerging growth. The standard when financing was a period of three to seven years, investing in every industry apart from the financial and real estate ones; but the particular interest of *InovCapital* focused on innovative areas such as Internet, electronic, telecommunications, and, of course, biotechnology. Its principal objective was to offer Small and Medium Enterprises (SME's) capital that could improve their competitiveness in the national market. At the time of the merger for the newly called Portugal Capital Ventures, *InovCapital* had about €260 million in funds under management and a portfolio of about 120 companies.

Exhibit 5.b Pharmis

Pharmis is a privately owned pharmaceutical company established in 1991, with focus on developing, marketing and selling of hospital commodities. It is a company that is already consolidated in Portugal, having subsidiaries in Brazil and Spain. Pharmis has diversified its investments throughout the years, taking a step into biotechnology and initiating the development of its own pipeline of products.

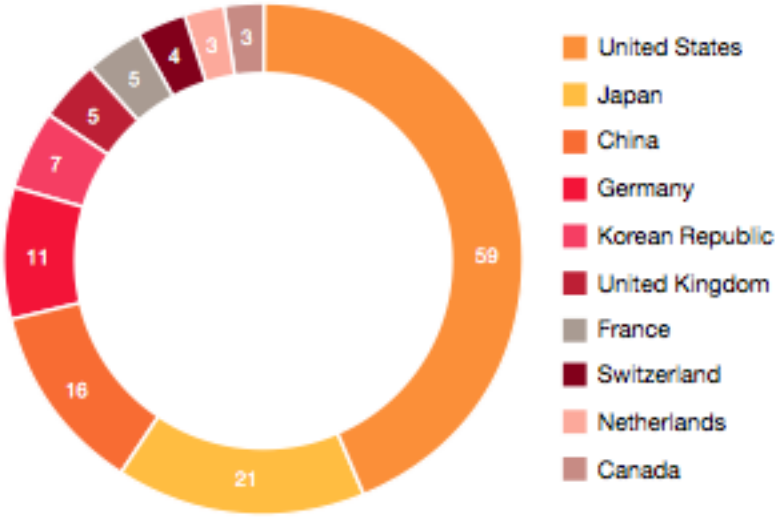
The entrance in the biotechnology industry was made through Biotecnol, where Pharmis acquired an equity stake that allowed for a straight collaboration in this business area; it also acquired IP rights to develop a biological molecule for cancer treatment, keeping its focus within the same one as Biotecnol.

Exhibit 6 Compound success rates by stage



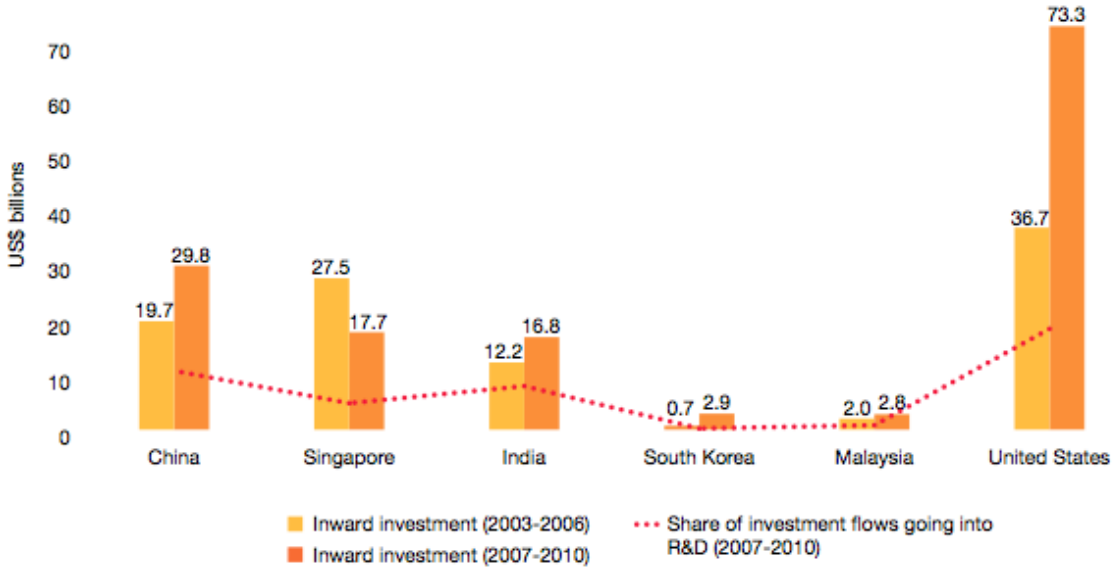
Source: Foundation, Alzheimer's Drug Discovery. September 2008. *The Pipeline Project Report*

Exhibit 7.a Patent filling (thousands)



Source: World Intellectual Property Organisation
Note: The top 10 countries generating biotech patent applications between 2005 and 2009

Exhibit 7.b Inward investment



Source: Jones Lang LaSalle

Exhibit 8 Tribody clinical trial phases

Pre-clinical phase – Before a new active substance can be used as a medicinal product, it has to be tested for its safety and efficacy *in vitro* and *in vivo*. Pre-clinical drug development process is a risk based process that involves safety and efficacy evaluation of drugs, including the evaluation of pharmacologic and toxicological drug responses with respect to dose regimen and route of administration, as well as safety and efficacy data from the animal models which support the conduct of research in human beings. Studies of drug toxicity include which organs are targeted by that drug and if there are any long-term carcinogenic effects or toxic effects. It is also during this phase that the production process is developed, optimized, scaled-up and validated. The first batches to be used in humans are produced by CMOs (Contract Manufacturing Organizations) under GMP conditions (Good Manufacturing Practices) using the developed production process, which remains unchanged along clinical trial phases and commercialization of the product. This phase takes 1 year, with an associated cost of $2 million[17], and an attrition factor[18] of 70%.

Phase 1 – In this first phase, Tribody would be given to a cohort of 20-100 persons in order to evaluate its efficacy. This phase takes about a year to be completed, and it is projected to cost $30 million, with an initial investment of $6 million from Biotecnol. The attrition factor is 50%.

Phase 2 – In this phase, the Tribody would be administered to a cohort of 100-500 persons, in order to test its efficacy in breast cancer treatment. Having the same attrition factor of 50%, and further two and a half years of clinical trials, it was anticipated to cost $15 million.

Phase 3 – In Phase 3 the cohort achieves considerable numbers. 1000-5000 persons are tested for the Tribody's efficacy and safety. With a time frame of three and a half years, this was the most costly phase. The attrition factor rose again to 80%, alongside with a cost $80 million.

The Tribody had considerable potential profit. If it surpassed the FDA process, the Tribody would yield a $150 million investment cost, with an associated present value at launch of $930 million[19].

Source: Biotecnol

[17] All cash flows are expressed as after-tax present values discounted to time zero, including capital expenditures, at Biotecnol's cost of capital of 30%.

[18] The probability of success the drug has of accomplishing the next phase.

[19] This value was computed as the after-tax present value of 10 years worth of cash flows from the drug discounted back to 2011. It is believed that after this time, the drug's value to Biotecnol is decreasing significantly along time, with a terminal value of zero after that.

January 2012

Guilherme Lopes da Costa

Teaching Note

Restructuring of Biotecnol

This case is intended for students wishing to explore the complex financing issues that most European biopharmaceutical firms have to face. It may be used in courses on entrepreneurial finance and venture capital. In order to dig into the case's resolution, students should assess the type of investors that may be willing to invest in biopharmaceutical companies, and what their role shall be in helping to develop these organizations. Furthermore, as Biotecnol is a Portuguese company, the risk that investors undergo when investing in these companies may also be evaluated. Based on the data provided in the case study, a decision tree analysis on how to evaluate drug licensing may be executed. Moreover, the instructor may have students assessing how a Portuguese biotechnology company in the Portuguese market, which has branched out to the United States, may survive, while having to decide whether the company should keep performing in two lines of activity – both services and proprietary products up and running – or decide on only one of the areas.

Opportunities for Student Analysis

1) Type and role of investors in biopharmaceutical companies.
2) Risks of investing in biopharmaceutical companies.
3) Difficulties of financing for these companies, with special attention to Portugal.
4) Analyse Biotecnol's operating and financial restructure and relate it with the final shareholder restructure.
5) Strategy dilemma of many biotechnology companies on the option of either focus on services or products.
6) Valuation of products that are subject to the FDA approval process.

Type and Role of Investors

Investors of the biopharmaceutical market have predetermined and specific characteristics that constitute pre requisites for their option on partnering and investing in these type of companies. This is the reason why the number of investors in this area is limited to just a few who are willing to take the chances on this market.

On one hand one finds pharmaceutical companies that have access to cutting hedge technology and the necessary knowledge and leverage to get a drug/product through the FDA approval process; and on the other hand, one has the venture capital firms that have the money and the will to invest, combined with the expertise of the industry.

Nowadays, pharmaceutical companies are increasingly using biotechnology companies as the vehicle that develops embryonic projects of products in their early stages and then, if successful, enter into in-licensing partnerships that leverage the product into further development of the pipeline in the approval process. As a rule, biotechnology companies do not usually have the necessary financial strength to fully develop their products, this being the reason why they couple with pharmaceutical companies that have the required financial power to take the projects to the end of the approval process. This situation means that although the biotechnology companies loose the product development, they guarantee a constant stream of cash flows associated to milestones the underlying product reaches on the development process and a royalty payment if the product reaches the market. Furthermore, coupling with big pharmaceutical companies brings the advantage of disposing of an adviser that may help in the development of the company's business.

Venture capital firms seek investment in seed and early stage companies that may provide them with a high return on the capital invested, if they have good performances. In order to be successful when investing in the biotechnology market, VC's need to have, other than the required expertise to analyse what are the best companies to put money into, the patience this market requires. Since it is not a normal market – in the sense that VC's would expect to have their return on investment in 10 years - these firms need to specialise on the specificities of the biotechnology market and help these companies develop their activities in order to achieve the required returns at exit. Besides the financial power to start up and to carry on the business activity, VC's also provide these companies with know-how and expertise supported by years of experience, which, in the end, renders them a higher valuation and thus higher returns on investment.

Risks of the Biopharmaceutical Market

As it is expected, investors seek the highest possible return with the minimum risk associated to it; but as one knows, usually the higher the expected return is, the higher the underlying risk associated. In the biotechnology market, that risk is the basic fundamental assumption investors

have to deal with every day. As confirmed by the data provided on the case, products that enter the FDA approval process have low attrition factors, since a situation of a 50% success in a phase of the approval process must be considered a high-risk investment. Furthermore, as the process evolves into more mature phases, the level of investment grows exponentially, leaving biopharmaceutical companies tied to the pharmaceutical companies who have the necessary investment cash flows to accomplish the process and take products to the market in order to receive the expected revenues from it.

In the case of Biotecnol, this challenge is slightly different: the company does not own a single product, but rather a platform with protected IP, meaning that the failure of a product in the approval process must not be considered in the same way as the one of a company that only has a single product. With its Tribody proprietary platform, Biotecnol presents investors with multiple opportunities of success and a praised diversification in their investment, since it allows for various chances of arriving to a product that can make it to the market and generate revenues.

Financing Biotechnology Companies

Biotechnology companies have huge financing needs. Developing a drug/product is a costly activity that requires massive amounts of money for research and development. Nevertheless, the fact that these high investments are carried out does not mean that they will be successful, once this is a peculiar business and it has a high probability of failure. This next section provides a summary of the options that are available to companies that need to finance their operations and development.

- Seed capital – in early stages of a company's development, founders have the ability (and normally are forced) to use personal funds to kick off the company, ask friends and families for loans, or have an angel investor putting its money in the company. Normal loans, from banks for example, are not an option at this stage, since the company does not have a proven track record of solid revenues.
- VC investment – in order to have a successful partnership, the choice for an equity investment in the company should fall upon a well-known player of the market with knowledge on the biotechnology area. Having the above-mentioned characteristics implies that the VC is in line with a biotechnology company's time required to achieve profitability (usually more than the 10 years, normal period of time that venture capital firms intend to have).
- Licensing – the project under development is sold to another company (normally a big pharmaceutical which has the needed capital to fully develop the project) and the seller gets upfront and milestone payments. This alternative is the best option when the selling company is in need of cash flow to develop its activity.

- Royalty financing – allows the company to have a constant stream of cash flows arising from the revenues of a product sold somewhere in the future.
- Public subsidies – usually defined for a certain area that the government wishes to develop, these subsidies are attributed to the companies that apply in accordance with a set of requirements, which include complying with certain milestones (i.e. financial ratios or operational activities).

In the biotechnology environment, debt financing is hardly ever used. Banks are the primal source of lending and their goal is to have assurance regarding the capability to repay the debt contracted. If a default should happen, the company's assets should be enough to cover the loan's value. Companies on the biotechnology sector usually do not have many tangible assets they rather have a good amount of intangible ones; and these do not stand as collateral when contracting debt.

When taking as an example a Portuguese company like Biotecnol that is operating in the Portuguese market, financing is the great challenge managers need to address. As shown in TN Exhibit 1, Portugal represents a minimum percentage of the funds raised when compared with its peers in Europe. Furthermore, the Portuguese market is not used to the high investment needs of biotechnology companies, which, in Biotecnol's case, may reach up to €10,000,000 a year to face all its costs and investment needs. As the market still needs to grow in order to achieve a more mature phase, Biotecnol turned its attention to the most mature market in the world: the US. After shifting its proprietary platform to the American subsidiary, due to the more availability of money to invest there, Biotecnol also pursued investment rounds targeting US based investors, thus achieving its financing needs.

Financial and Operational Restructure

The first restructure that Biotecnol experienced was focused on the operation, which was followed by one on the financial are. Both actions were linked in the sense that the latter could not have happened without the first one. Operations were restructured so that Biotecnol would have an increase in its cash flows, once their inexistence was affecting the company's activity. No cash flow meant no money allocated to the development of proprietary products, which was Biotecnol's goal of activity.

After the increase in revenues due to services provided, Biotecnol focused on its financial problem - Pharmis and *InovCapital* loans needed to be paid back. The solution, as presented in the case, was the conversion of these loans into equity, easing the balance sheet of the underlying debt.

When dealing with the resolution of this case, students should be able to relate this financial restructure with the shareholder restructure - after the conversion, the equity part belonging to *InovCapital* was sold out evenly to all the remaining shareholders, leaving the company with a solely private shareholder capital structure.

Biotecnol has had capital increases since its birth, mainly through equity financing from the now existing shareholders, which allowed it to stabilize its balance sheet and carry on with the company's activity. Biotecnol also received loans from some shareholders, which in the end were converted into equity.

Strategy Dilemma

With a subsidiary in the US, which now performs separate activities from the ones based in Portugal, it is now time for the company's management to decide on Biotecnol's future: Biotecnol SA, Portugal based, is providing services, either to the American subsidiary, or to other companies; the American subsidiary, that has the Tribody proprietary platform to develop products, in a country where investment and investors are much more willing to partner with biotechnology companies than in Portugal.

Reaching this phase, students should perform their analysis stating their opinion on what is the path Biotecnol should undertake, embodied by arguments to justify the actions presented.

Decision Tree Analysis

With the information provided by this case, one may outline a Decision Tree Analysis (DTA) in order to evaluate a product from the Tribody proprietary platform. This approach was chosen because it is a simplistic NPV of a drug/product, which does not require a real option valuation. As it is, only rough estimates of the required inputs were available to perform the latter, which in reality is more of a commodity driven valuation method and a far more complex approach.

The DTA method states that investment at each phase is contingent on the success of the previous phase, thus making these projects a chain of real options looking like a decision tree. At each node the project has successfully passed the previous phase (otherwise it is automatically shut down) and the decision is simply to decide whether or not to advance to the next one, i.e., whether the expected value of future cash flows (taking in consideration the probability of success at each future phase) exceeds the investment amount required to advance to the next phase. The decision tree provided in TN Exhibit 2, presents the results with all cash flows discounted to the present at the cost of capital of the Biotecnol, which is assumed to be 30%. It is also assumed that Biotecnol only halts the project if one phase fails. The present value of the Tribody is $83,750,000. This outcome may also be achieved by computing each cash flow for every phase, multiplying it by its probability of occurrence, and in the end, summing up all of them in order to achieve the same NPV. This similar approach is presented in TN Exhibit 3.

Suggested Questions:

1) Is Biotecnol attractive to an international investor?
2) How can a biotechnology company like Biotecnol have access to financing?
3) Should Biotecnol maintain its service providing? Should it maintain its proprietary platform? Is it possible for Biotecnol to maintain both? Develop a consistent opinion on what Biotecnol should do, taking into consideration historical and financial information.
4) What is the Tribody's NPV? Compute using a decision tree analysis with the values presented on the case.

Teaching Plan

This teaching plan proposes class discussion in a 50 + 50 minute class model. All students should already have been mandated to define groups and work together on the presentation, in order to encourage and enable a participative class discussion between them and the instructor.

(30 minutes) 1) Students presentations. 15 minutes for each group, 2 presentations in order to compare perspectives and results on the analysis performed.

(15 minutes) 2) Type and role of investors in biopharmaceutical companies.

(20 minutes) 3) Difficulties and risks on financing biotechnology companies – Biotecnol's case.

(20 minutes) 4) Pathway to follow:

i) Keep services and products;
ii) Keep only services;
iii) Keep only products;
iv) Instructor's view of Biotecnol's pathway, sharing the information he has at the time.

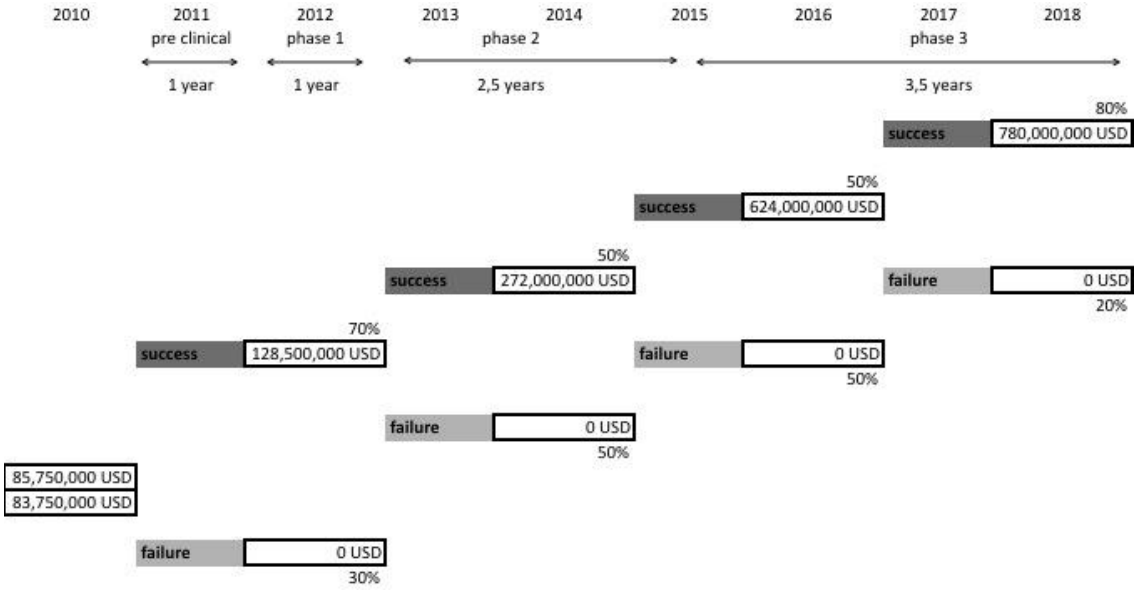
(15 minutes) 5) Decision Tree Analysis (DTA) – Valuation of products.

TN Exhibit 1 Total funds raised in 2007 and 2008

	2007	2008	
Amounts in € millions	Amount	Amount	Change %
United Kingdom	43,808	46,452	6.0
France	6,551	10,778	64.5
Sweden	4,686	6,612	41.1
Switzerland	1,478	3,081	108.5
Germany	5,662	2,410	-57.4
Spain	3,298	2,224	-32.6
Netherlands	3,141	1,586	-49.5
Italy	2,408	1,455	-39.6
Norway	703	1,282	82.3
Finland	1,015	903	-11.0
Poland	571	760	33.3
Belgium	598	608	1.6
Denmark	361	258	-28.5
Austria	431	230	-46.6
Ireland	466	155	-66.7
Hungary	0	120	-
Greece	5,570	20	-99.6
Czech Republic	78	19	-75.7
Portugal	496	15	-96.9
Romania	36	0	-100.0
European total	**81,355**	**78,967**	**-2.9**

Source: Yearbook, EVCA. 2009. *Pan-European Private Equity & Venture Capital Activity Report*.

TN Exhibit 2 Decision Tree Analysis Output



TN Exhibit 3 Output for the PV of the Tribody

Accrued Probability	CF	PV
14.00%	677,000,000 USD	94,780,000 USD
3.50%	-103,000,000 USD	-3,605,000 USD
17.50%	-23,000,000 USD	-4,025,000 USD
35.00%	-8,000,000 USD	-2,800,000 USD
30.00%	-2,000,000 USD	-600,000 USD
100.00%		83,750,000 USD

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